

EXECUTIVE SUMMARY

A study was conducted to understand and model operations of the Bamberger Pond-DRMO Pond system. The reason for this study is that arsenic and manganese contamination may be being driven off base by the groundwater mound which results from infiltration beneath Bamberger Pond. If seepage from the pond is eliminated, the contamination is likely to remain on base, which is preferable. However, water that currently leaves the pond via seepage must be removed in some other fashion if the pond is lined. While overflows to Fife Ditch currently remove some excess water, they must not increase as a result of any corrective actions. Correct understanding and realistic modeling of the pond system allows for evaluation of mitigation alternatives.

Monitoring of flows into Bamberger Pond, and volumes in Bamberger Pond and DRMO Pond, was conducted from March 31 to June 14, 1997. During this time, both ponds were also surveyed and level-storage-surface area relations were developed. Based on measured rainfall, flow, and associated changes in pond volumes, rainfall/runoff relations for both ponds were developed. Also, for days with no measured precipitation, relationships between average depth and pond loss were developed.

A SWMM (EPA's Storm Water Management Model) model was constructed to represent the watersheds tributary to each pond, and calculate flows entering each pond during extreme (10-, 25-, and 100-year, 24-hour) storms. The model was calibrated to two of the storms monitored. Per the model results, runoff from the 10-year storm can be contained in both ponds if they are empty at the beginning of the storm. Runoff from the other two storms can also be contained in DRMO (capacity 14.0 acre-feet) Pond under the same conditions, but would exceed the capacity of Bamberger Pond (capacity 12.6 acre-feet) and overflow to Fife Ditch.

Based on the analysis of monitoring data, an Excel model was constructed to model operations of both ponds, to include inflow from storms, seepage, and evaporation. The model also allows for the evaluation of alternatives associated with eliminating seepage at Bamberger Pond. These include enlarging one or both ponds, and pumping from Bamberger Pond to DRMO Pond. This model was used to evaluate mitigation alternatives, discussed in the accompanying report (Conceptual Design Report, Bamberger Pond Modifications and Related Modifications to the Base Stormwater Drainage System, Dames & Moore, July 1998).